FIG.1 General Radio Frequency Synthesizer

$$fc=f1+f2+f3$$

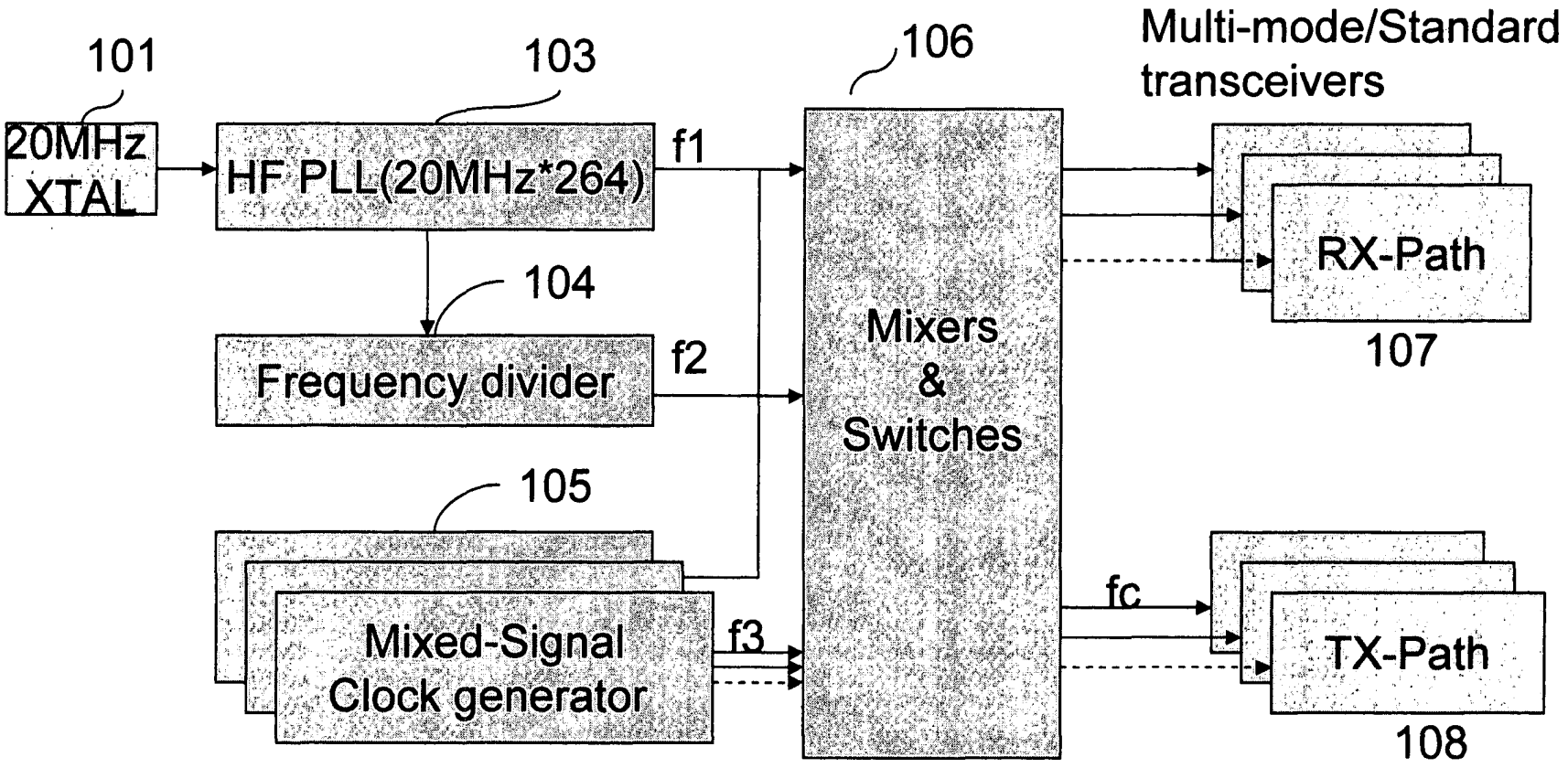


FIG2. Direct Conversion transceiver

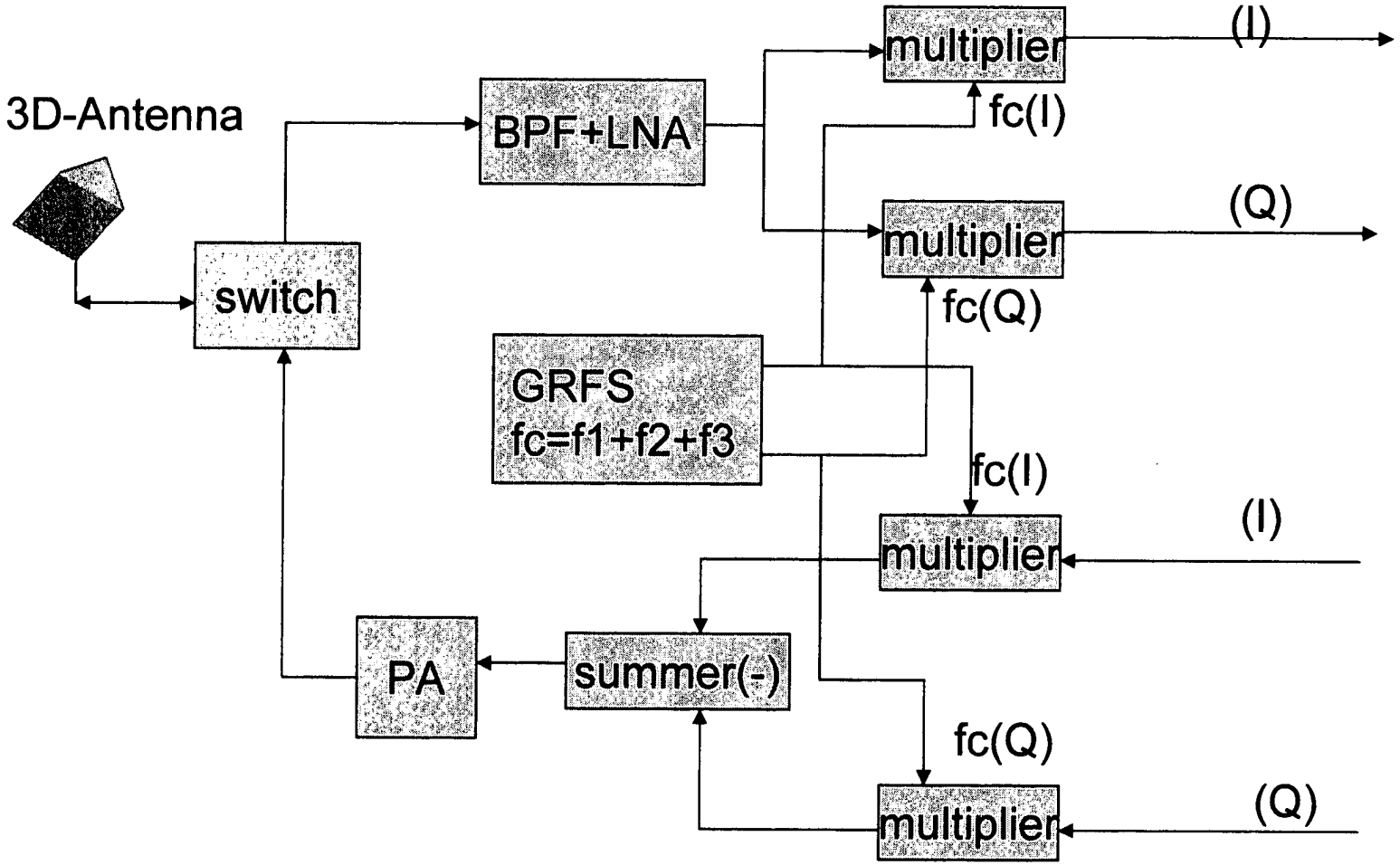


FIG.3 Direct Conversion Tranmitter and multi-stage receiver

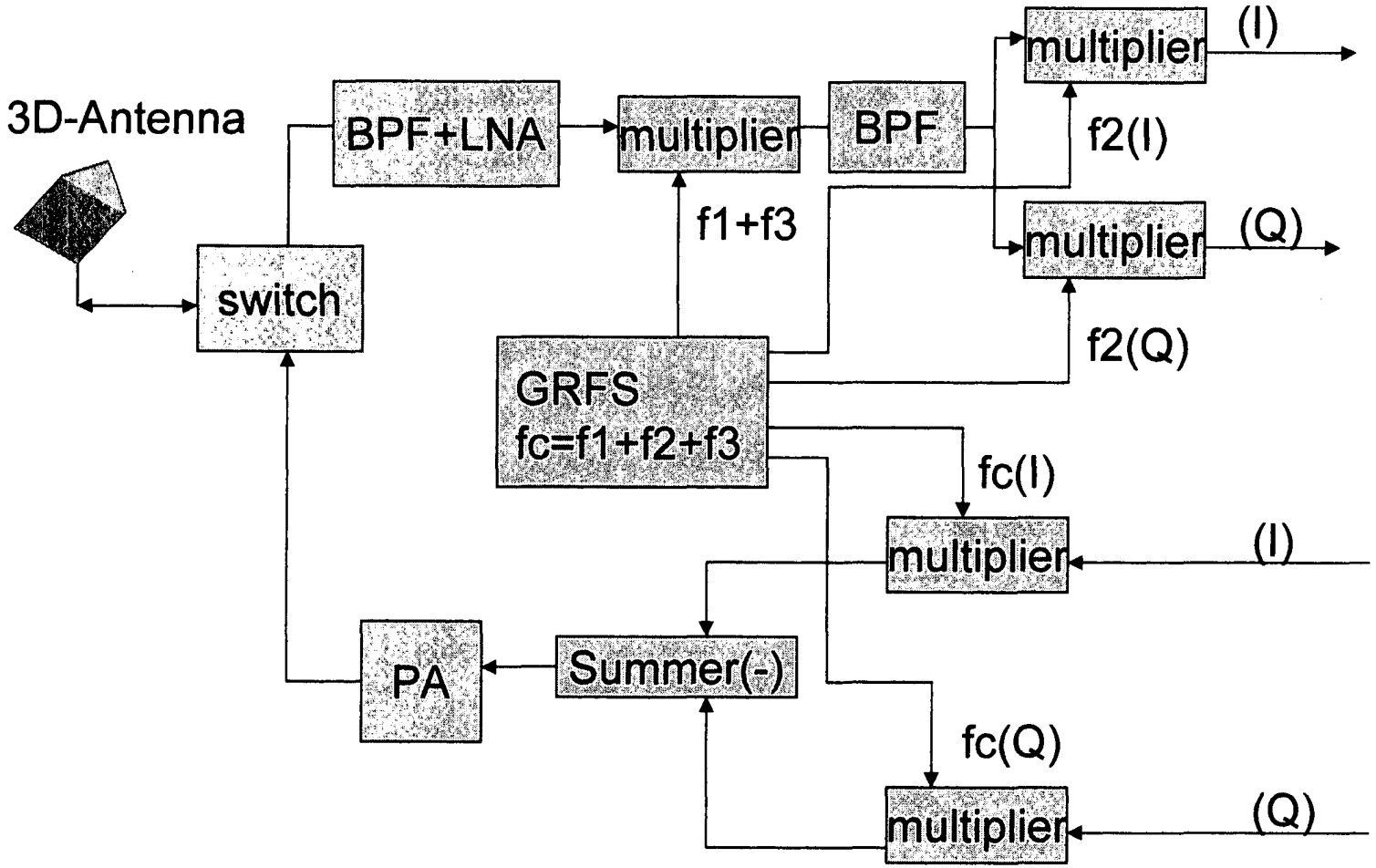
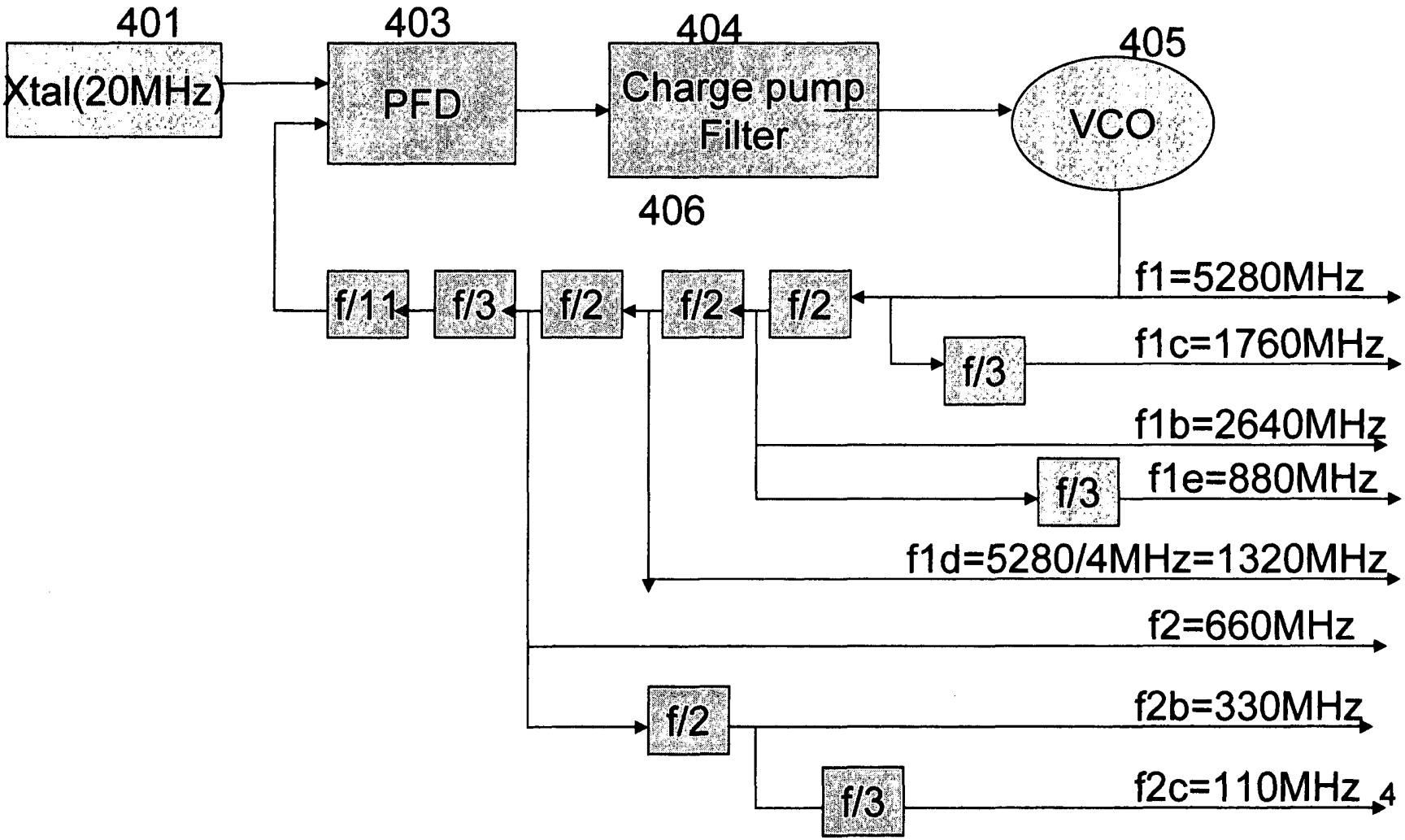
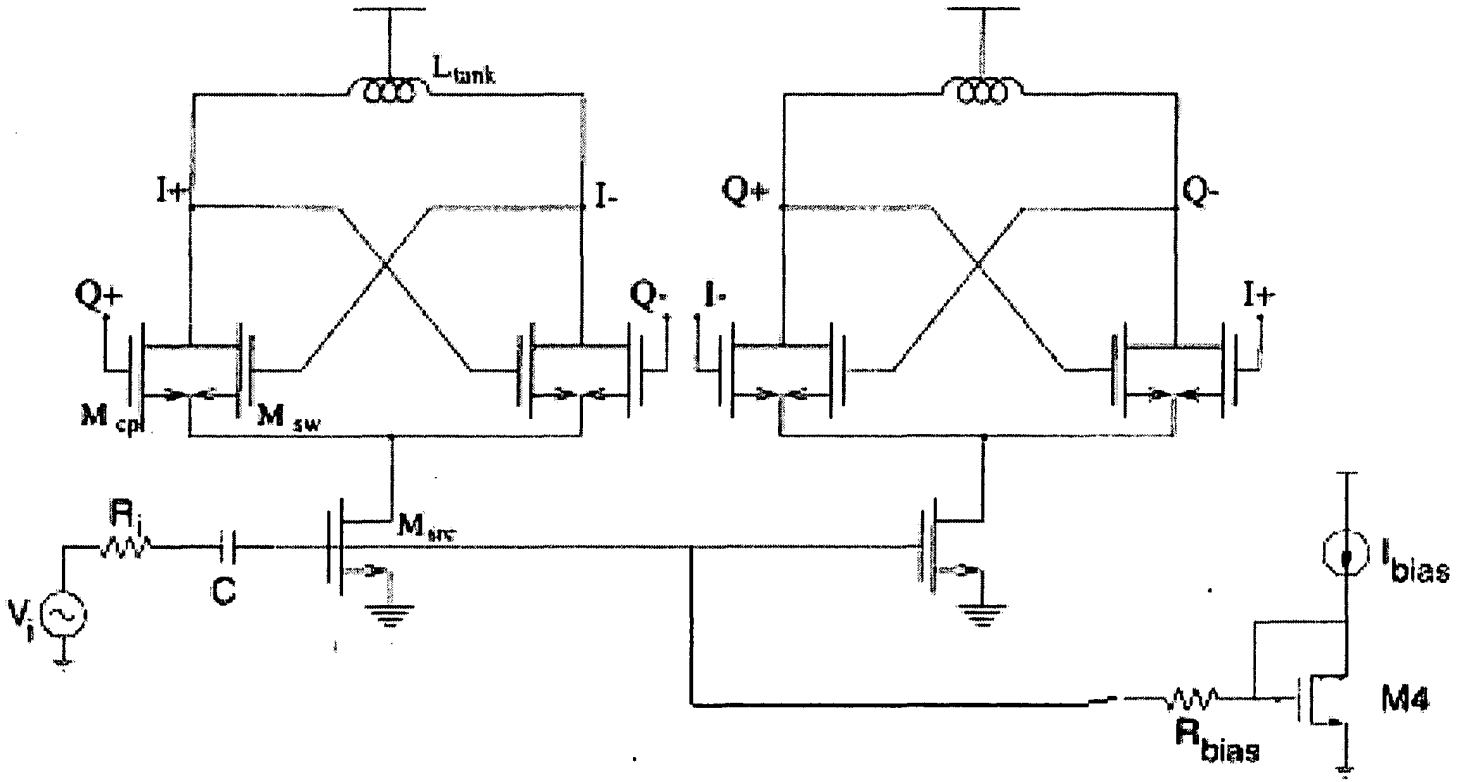


FIG.4 frequency generator PLLs



FIGS.5a Superharmonic parallel Quadrature injection locked frequency dividers



FIGS.5b Superharmonic Serial Quadrature Injection-Locked Frequency Divider

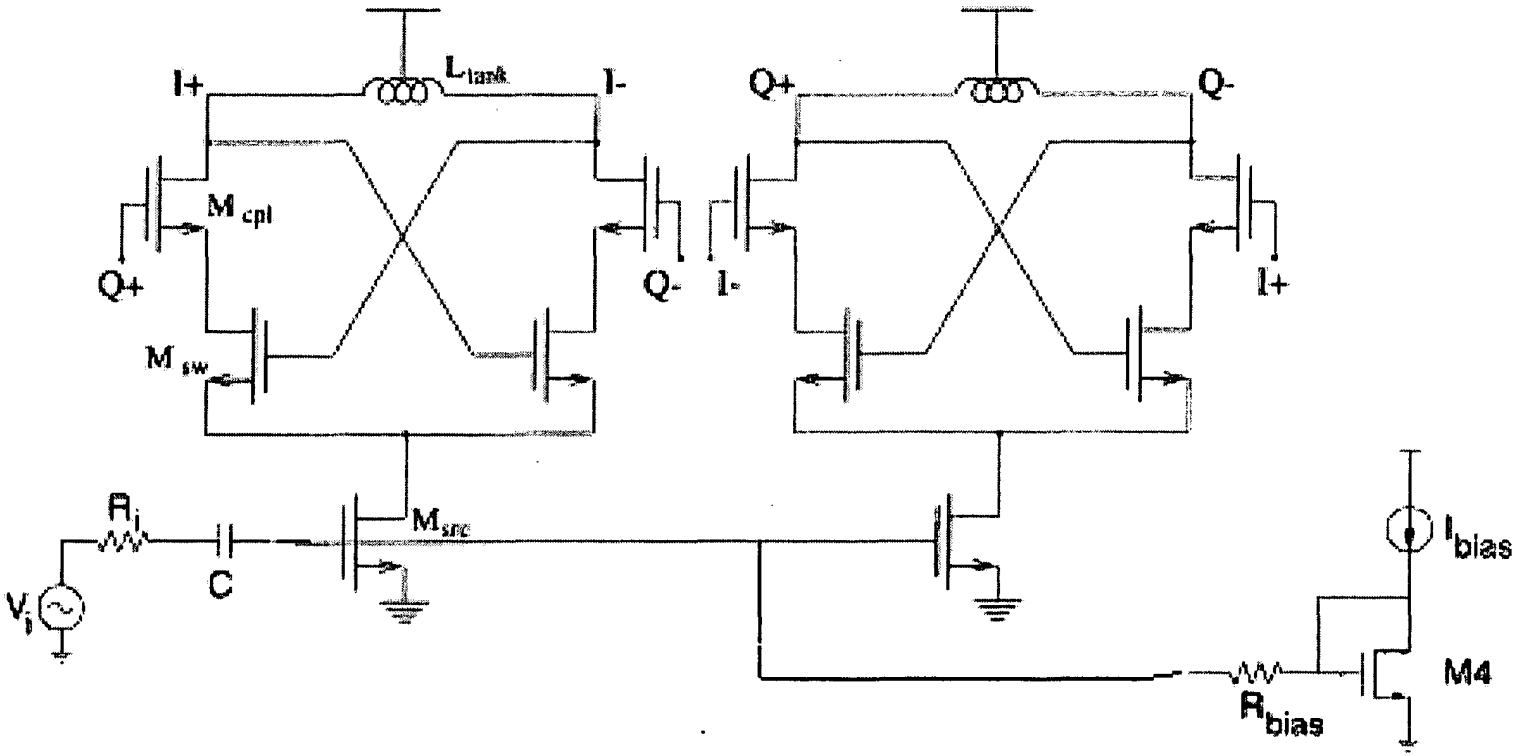


Fig6.Mixed-Signal Clock Generator

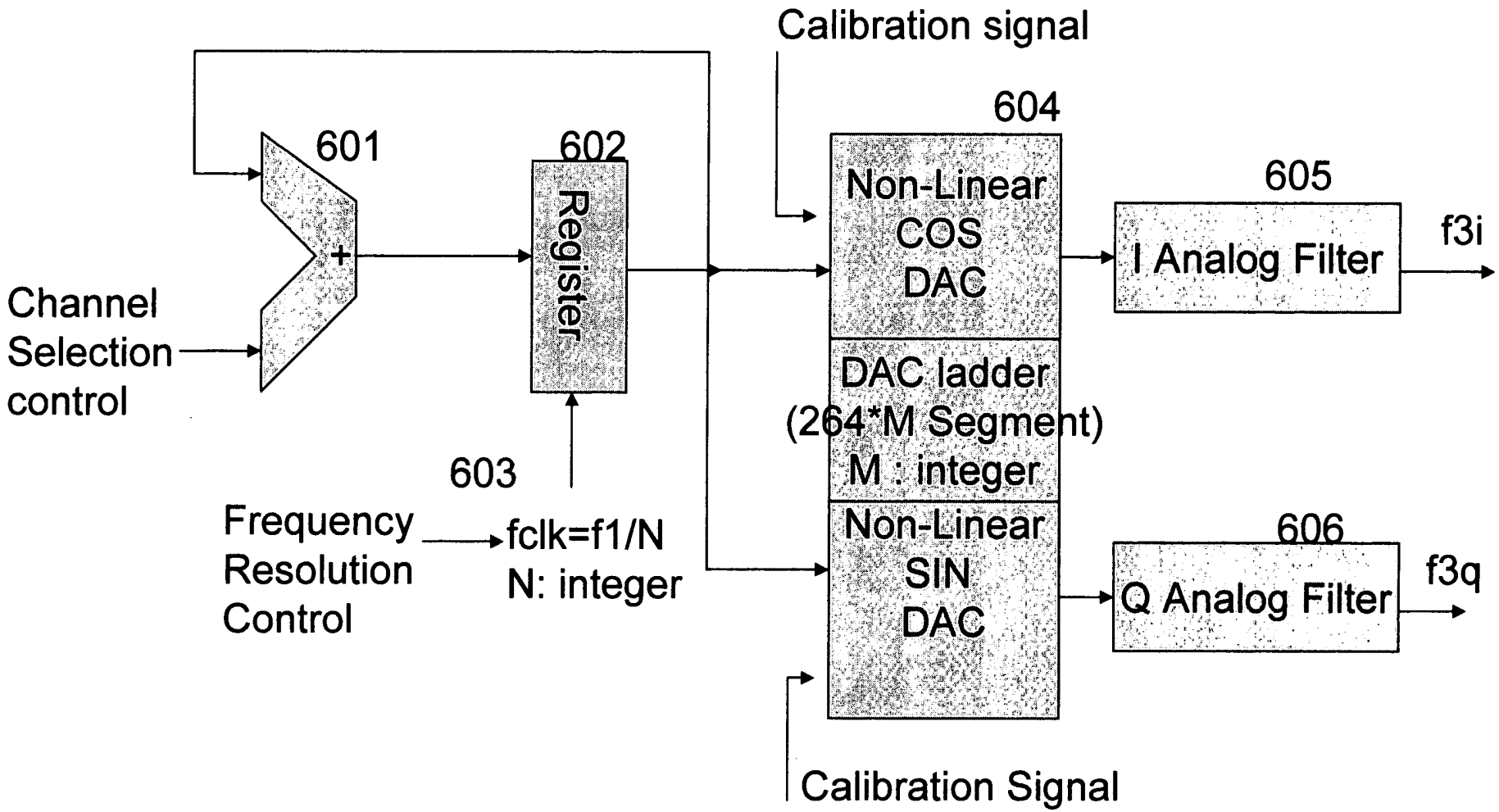
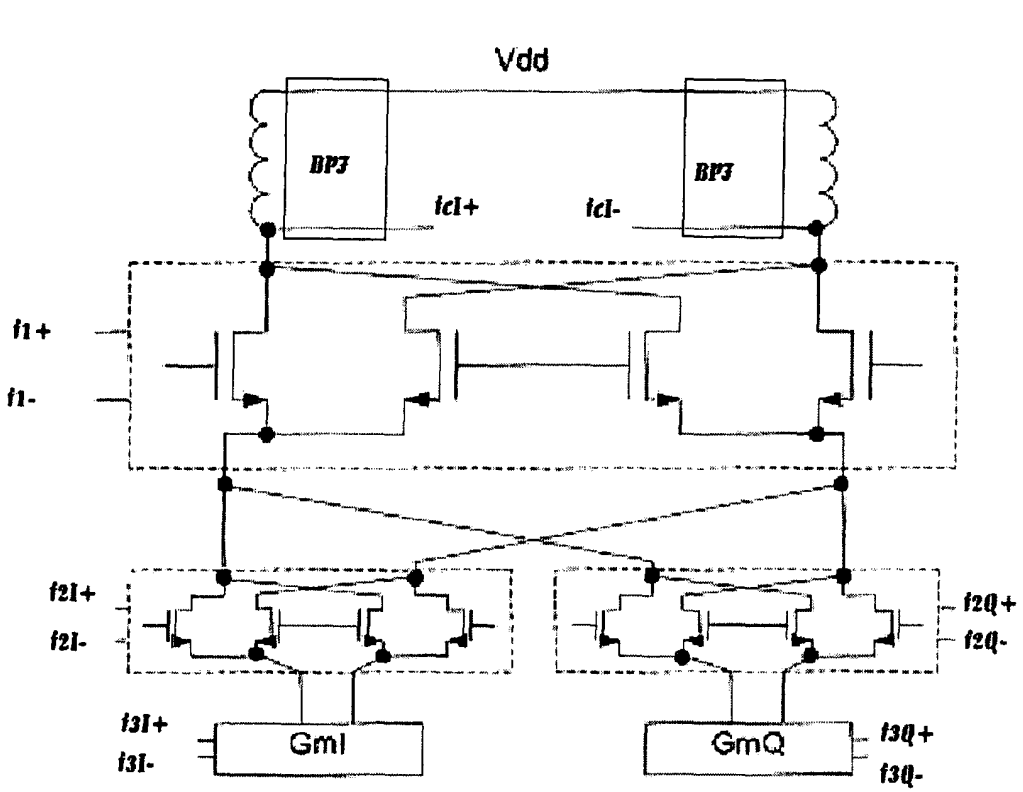


Fig7.Two kinds of three input mixers

mixer:a*b+c*d



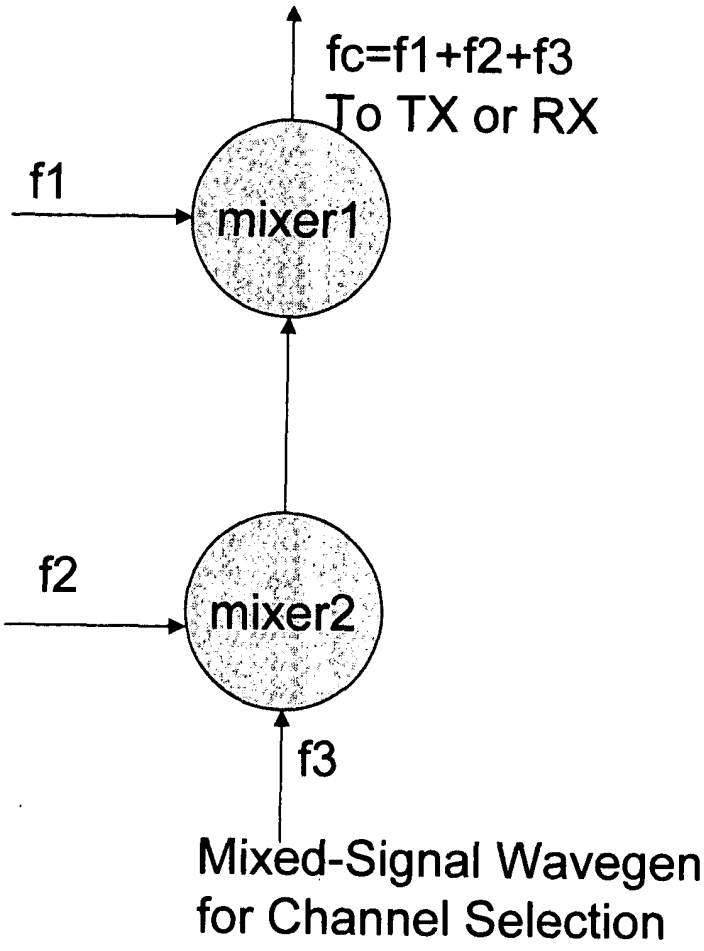


FIG.8 Direct Conversion transceiver IEEE802.11a/b/g

Unit:MHz

11a-low5Gband fc=5180:20:5320 f1=5280 f2=0 f3= -100:20:40

11a-high5Gband fc=5745:0:5805 f1=5940 f2=0 f3=-195:20:-135

11b fc=2412:5:2472 f1=2420 f2=0 f3=-8:5:52

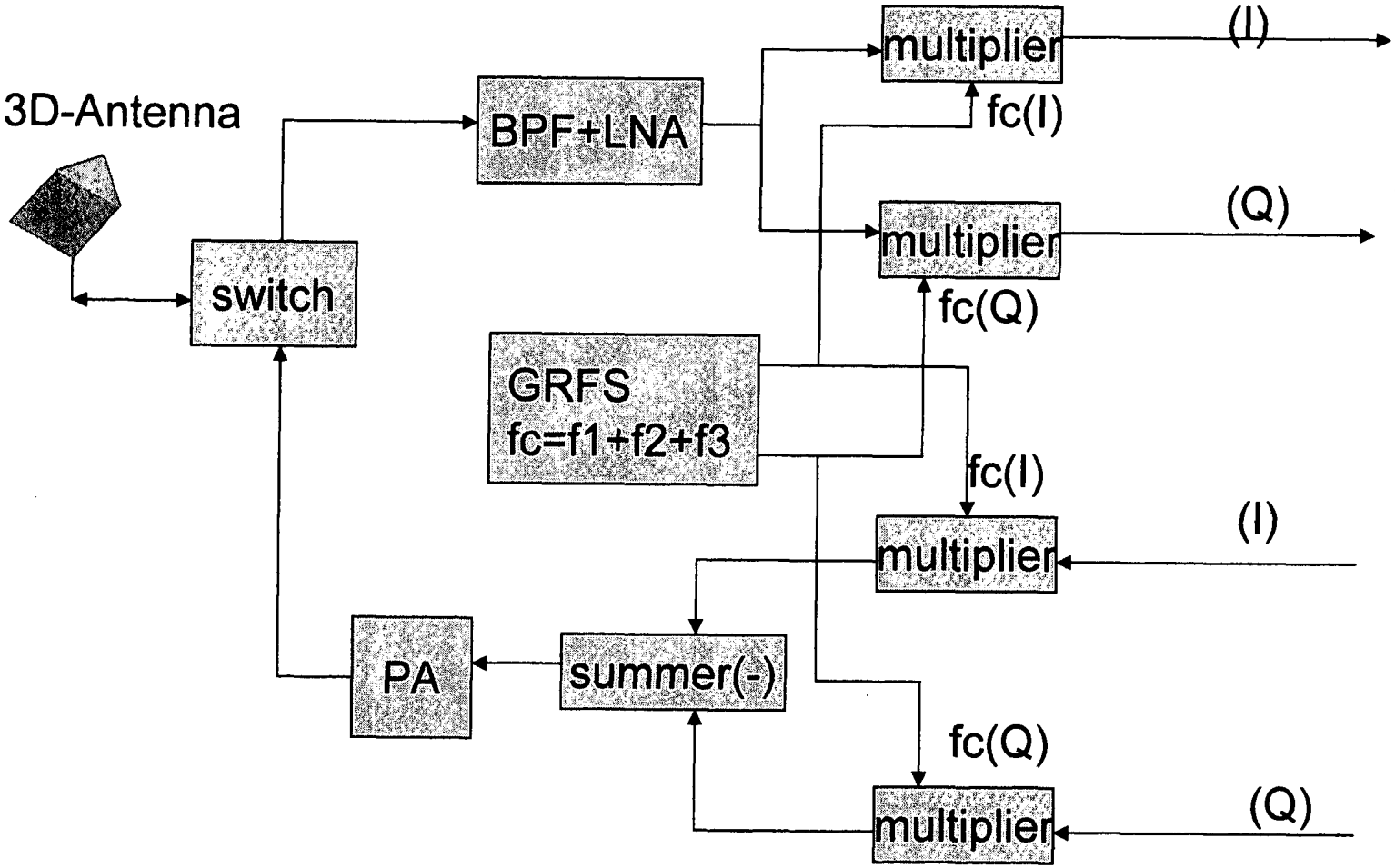


FIG. 9 Direct TX, High-IF RX transceiver IEEE802.11a/b/g

Unit:MHz

11a-low5Gband fc=5180:20:5320 f1=4620 f2=660 f3= -100:20:40

11a-high5Gband fc=5745:0:5805 f1=6600 f2=-660 f3= -195:20:-135

11b fc=2412:5:2472 f1=3080 f2=-660 f3= -8:5:52

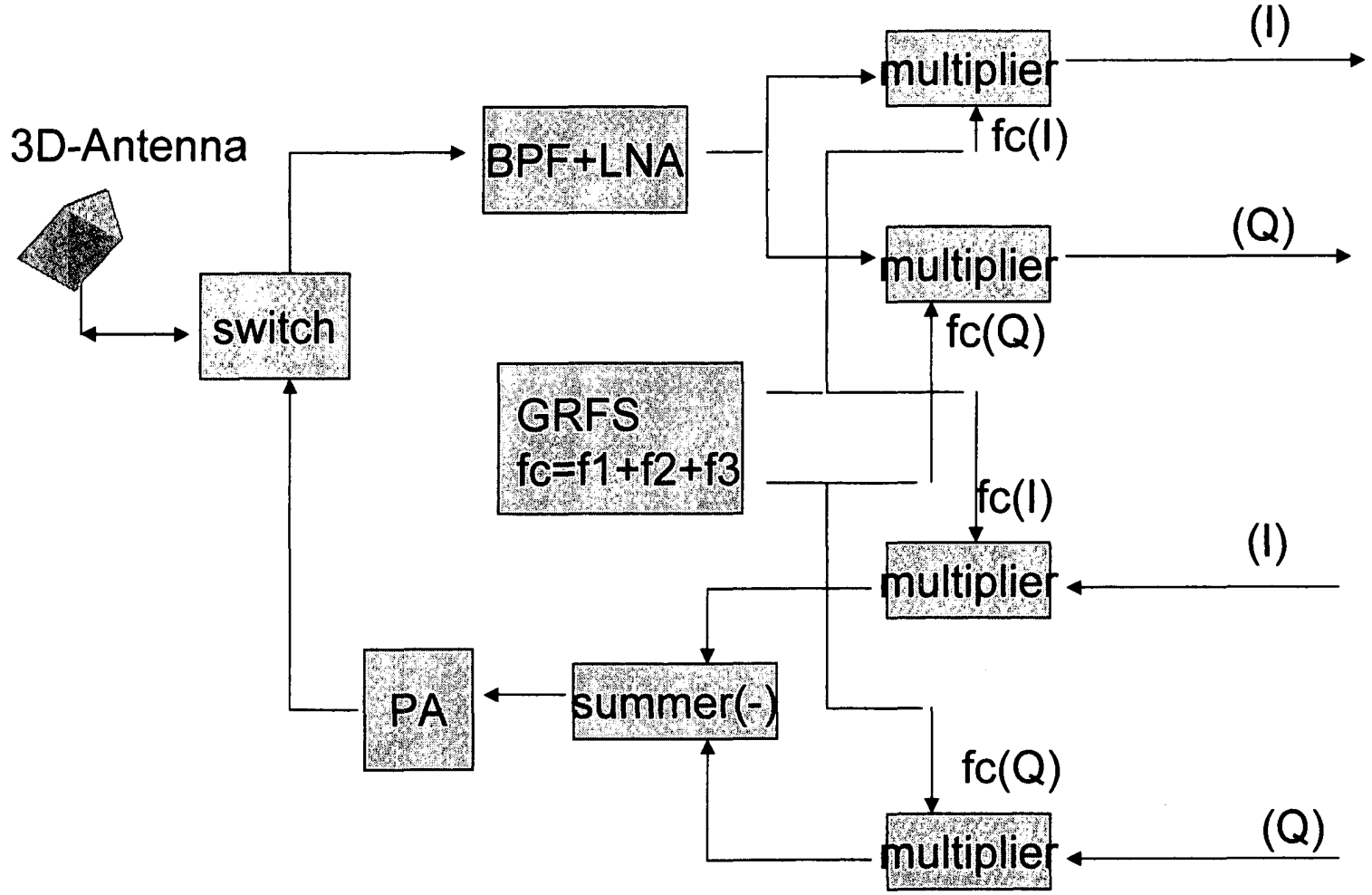


FIG.10 Direct TX Low-IF RX transceiver IEEE802.11a/b/g

Unit:MHz
11a-low5Gband fc=5180:20:5320 f1=5280 f2=20 f3= -80:20:60
11a-high5Gband fc=5745:0:5805 f1=5940 f2=20 f3= -175:20:-115
11b fc=2412:5:2472 f1=2420 f2=22 f3= -30 :5:30

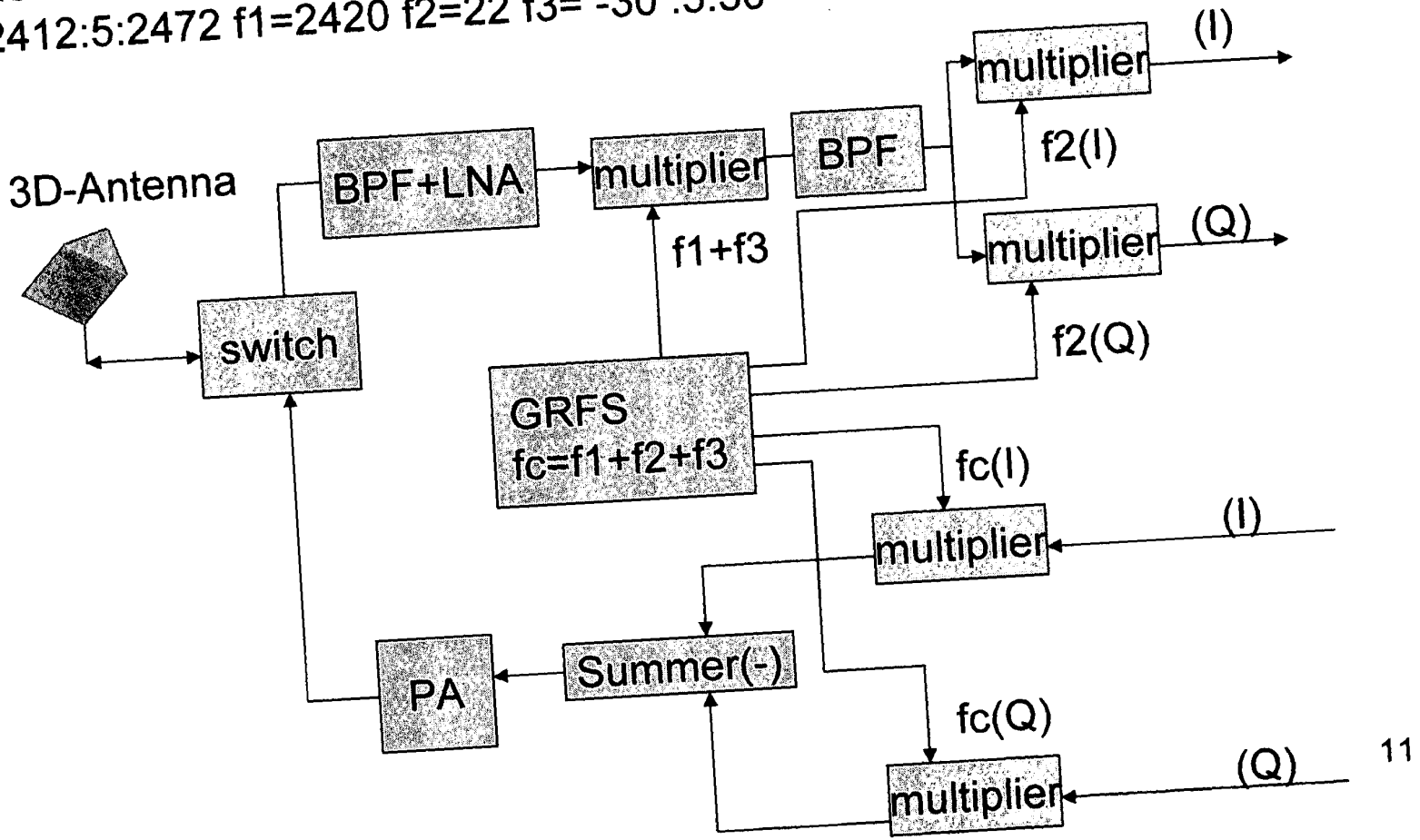


FIG.11 Multi-port design example